

GOVERNMENT OF THE DISTRICT OF COLUMBIA  
Department of Energy and Environment

**CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM**

TO: Stephen S. Ours, P.E. *SSO*  
Chief, Permitting

FROM: John Nwoke *JN For JCN*  
Engineer

SUBJECT: **The U.S. Naval Research Laboratory  
Building 57 Dust Collector  
Permit No. 7257 to Construct and Operate a New Dust Collector**

DATE: May 28, 2019

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**BACKGROUND INFORMATION**

On April 2, 2019, the Air Quality Division (AQD) received an air permit application from the U.S. Naval Research Laboratory (NRL) to construct and operate a new dust collector at Building 57 at NRL's 4555 Overlook Avenue SW facility. The dust collector is a Downflo Evolution model DFE 2-12 which will complement dust collection in Building B57.

The dust collector will be used to support woodworking activities alongside existing dust collectors in the facility. This dust collector, as with the existing dust collectors are vented outside, necessitating a construction and operating permit. Previously existing dust collectors are included in the Title V permit as miscellaneous activities.

NRL has not requested that any portions of the application be held confidential.

**TECHNICAL INFORMATION**

NRL applied for a permit to construct and operate a new dust collector, which will replace an existing old dust collector at the facility. The new dust collector is a Downflo Evolution, model DFE 2-12. The unit is a continuous-duty, modular collector with cartridge-style filters. According to the manufacturer's documentation, the downward airflow design delivers high filtration efficiency while using less energy.

Filter cleaning occur using on-line pulse jet technology, making the system amenable to continuous operation without the need to stop the operation for filter changes. Consequently, airflow through the filter is not interrupted as the filters are pulse cleaned on-line. Pulse cleaning is done sequentially, one set at a time, without turning the collector off. NRL applied for a construction and operation permit to allow the replacement of the existing old dust collector, thereby ensuring continued environmentally sustainable woodworking operations.

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### Emission Evaluation

NRL considered the dust collector as miscellaneous emission source in evaluating the emissions. It was assumed that 85% of PM comes from PM<sub>10</sub>, and PM<sub>2.5</sub> is equivalent to PM<sub>10</sub>. In computing the worst case particulate matter emissions, it was assumed that woodworking operation will occur for 112 hours per week and 52 weeks per year, resulting in 5,824 hours of woodworking operations in a calendar year. The table below shows the estimated emissions from the woodworking activities. It is very difficult to estimate emissions from woodworking operations due to their sporadic nature and a limited amount of emission factor data (no appropriate factor is included in AP-42). As such, NRL back-calculated the emissions from the allowable emissions level in 20 DCMR 603. It is likely that this significantly overestimates eventual actual emissions, even on an hourly basis

Table 1: Estimated Maximum Emissions from Dust Collector

<b>Pollutant</b>	<b>Dust Collector Maximum Emissions</b>	
	<b>lb/hr</b>	<b>tons/yr</b>
Total Suspended Particulate Matter (TSP)	1.62	4.72

## **REGULATORY REVIEW**

### 20 DCMR Chapter 2, Section 200: General Permit Requirements

As noted in the background section of this technical memorandum, the dust collector is vented outside, necessitating the need for a construction and operating permit. The provisions of this section are applicable to the dust collector as a stationary source of air pollution. A permit is therefore required to operate the unit pursuant to 20 DCMR 200.1 and 200.2. Operation permits are valid for five years. Upon expiration, they may be renewed to allow for the continued operation of the permitted activity. It is expected that the requirements of the resulting Chapter 2 permit will be incorporated into a Title V operating permit before renewal of this separate permit to construct and operate expires.

### 20 DCMR Chapter 2, Section 204: Permit Requirements for Sources Affecting Non-Attainment Areas

The review of the Chapter 2 permit application indicated that the proposed equipment would not emit any pollutants other than particulate matter. The maximum annual emission of 4.72 tons per year of PM is less than the 100 tons per year threshold that would trigger NSR requirements for PM. The proposed project will not generate emission in excess of the significance threshold, and therefore the project would not be considered a new major stationary source or a "major modification" as defined in 20 DCMR 299. Therefore, pursuant to 20 DCMR 204.1, a major non-attainment new source review analysis is not required.

### Prevention of Significant Deterioration (PSD) (Federal program)

The project will have a potential to emit (PTE) of less than 250 tpy for all pollutants, thus this project is not subject to the PSD program (implemented by EPA).

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### 20 DCMR Chapter 2, Section 205: New Source Performance Standards

Subsection 205.1 of 20 DCMR adopts the federal New Source Performance Standards (NSPS) as in effect on September 30, 1997. Additionally, in order to be sufficiently protective of public health pursuant to 20 DCMR 201, the Department places all current NSPS standards, if applicable, into all Chapter 2 permits issued. However, there is no applicable NSPS requirement for the dust collector as a control device. Hence, no NSPS requirement is in the permit.

### 20 DCMR Chapter 2, Section 209: Permit Requirements for Non-Major Stationary Sources (Minor New Source Review)

The emissions of PM10 (and PM2.5) are expected to be less than 5 tons per year. As such, this section is not applicable.

### 20 DCMR Chapter 3: Operating Permits and Acid Rain Programs

The project is not subject to the Acid Rain Program. However, the equipment will be part of a larger facility subject to the major source operating permit program of 20 DCMR Chapter 3. As such, pursuant to 20 DCMR 301.1(a)(2), the facility must apply for the requirements of this permit to be placed into its existing Title V operating permit. This requirement is contained in Condition I(g) of the proposed permit.

### 20 DCMR Chapter 5: Testing, Monitoring and Record keeping Requirements

Testing, monitoring and record keeping requirements, pursuant to 20 DCMR 201 and 500.8, respectively, have been included in the permit documents under Condition IV and Condition V. These requirements are also based on 20 DCMR 200.7.

### 20 DCMR Chapter 6: Particulates

20 DCMR 603 is applicable to this dust control equipment, thus its requirements have been included. Note, however, that Appendix 6-1 cannot be reasonably applied in the case of a woodworking shop. The requirements apply on a "process weight per hour" basis. Based on the definition of "process weight" in 20 DCMR 199, the weight in question would be the weight of the wood materials being worked. However, in reality, there is no relationship between the weight of a wood object and the amount of sawdust produced from working it. For example, cutting across a "2x4" will produce the same amount of sawdust whether the "2x4" section is one foot long or eight feet long, while there would be an 8-fold difference in weight between the two "materials" being worked. As such, only the default 0.03 gr/dscf standard in 20 DCMR 603.1 is being applied.

20 DCMR 606 is also applicable, however, given the expected particulate matter size from woodworking, any visible emissions at all are observed being emitted from this dust collector are a sign of filter failure. Therefore, the exceptions to the zero percent opacity standard in Section 606.1 have not been included in the permit language and 20 DCMR 201 authority has been cited as the basis for the tightening of the requirement.

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### 20 DCMR Chapter 8: Asbestos, Sulfur, Nitrogen Oxides, and Lead

The fuel sulfur provisions of 20 DCMR 801 are not applicable because the control equipment does not combust fuel and so will not use fuel oil.

The NO<sub>x</sub> RACT provision of 20 DCMR 805 (revised regulations promulgated in final form on December 14, 2018) is not applicable to particulate matter. Particulate matter requirements were discussed earlier.

### 20 DCMR Chapter 9, Section 903: Odorous or Other Nuisance Air Pollutants

The dust collector could discharge emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 903.1 is applicable. This requirement is contained in the proposed permit.

### Other Regulations

#### Compliance Assurance Monitoring (CAM) (40 CFR 64)

The project is not subject to this Part because the pre-control emissions of pollutants for all sources are less than 100 tpy for PM.

## **RECOMMENDATIONS**

The draft renewal permit will be published in the D.C. Register and on the Department's website on June 7, 2019 for a thirty-day public comment period.

The proposed project and attached permit comply with all applicable federal and District air pollution control laws and regulations. I recommend that the attached permit be issued promptly following the completion of the public review period if no comments are received. If comments are received, they will be addressed before any final action is taken on the permit application.

SSO/JCN

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